

1 SHOE FASTENING AND CLOSURE DEVICE AND METHOD OF USING SAME

2 Cross-reference to Related Applications

3 This non-provisional utility patent application claims the benefit of prior filed US  
4 Provisional application serial number 60/492097 filed 07/31/2003.

5 Background of the Invention

6 (1) Field of the Invention

7 The present invention relates generally to shoes and, more particularly, to a shoe  
8 fastening and closure device for opening and closing a shoe.

9 (2) Description of the Prior Art

10 Typically, shoes are put on and removed by a user inserting the foot into an  
11 opening, with securement being provided while the shoe is worn by fastening or closing  
12 each shoe tongue; it is opened or loosened to remove the foot from the shoe.

13 Prior art shoe fasteners commonly employ shoe laces, hook-and-loop type  
14 fasteners, commonly known commercial by the trademark VELCRO, or buckles for  
15 releasably securing a shoe tongue after a user's foot is inserted into the shoe. However,  
16 shoe laces and hook-and-loop type fasteners are subject to wear over time, resulting in  
17 breaking of the laces and non-securement of the hook-and-loop fastener mating  
18 components. Also, buckles typically result in wear or stretching of the corresponding  
19 mating hole, which prevents consistent securement of the shoe by the fastener over time.  
20 All of these prior art fasteners are time-consuming to use, and are subject to release or  
21 loosening during wear, which can be dangerous for the shoe user, especially in sports or  
22 other activities where securement of footwear is critical to performance, since the shoes,  
23 like other athletic implements are intended to be extensions of the athlete to enhance

1 performance, not to introduce dangerous circumstances that can lead to injury, or  
2 compromised performance at the least.

3 Prior art shoe fasteners may further be considered to include fasteners for boots,  
4 such as speed laces or snap lock fasteners, such as used on in-line skates.

5 Finally, relevant prior art shoe fasteners, including US patent nos. 2969573 and  
6 2637087, teach shoe fastening devices having latch devices for releasable securement of  
7 a shoe, including resilient wire wing members forming a V-shaped member. However,  
8 the prior art does not provide for readily adjustable tightening, and does not provide for  
9 adaptability to a variety of shoe styles or types, among other differences in design,  
10 construction, and function from the present invention.

11 Thus, there remains a need for a shoe fastening device having quick release and  
12 securement properties while ensuring reliable, adjustable securement during shoe wear by  
13 a user and over time.

#### 14 Summary of the Invention

15 The present invention is directed to a shoe fastening device for providing reliable  
16 releasable securement for shoes, particularly for sport or athletic shoes, but also used for  
17 general shoe or boot applications.

18 In the preferred embodiment, a shoe fastening device according to the present  
19 invention includes a slide portion formed by a pair of spaced apart parallel rods or  
20 members having a corresponding ratchet portion that slides along from top to bottom  
21 ends of the rods for opening and closing the device, which is inserted into a tongue or  
22 upper vamp area of a shoe and welded, sewn, or otherwise secured in place, such as with

1 adhesives, so that movement of the ratchet portion produces a corresponding movement  
2 of the tongue portion of the shoe for opening and closing it.

3 Preferably, the device may be formed of a rigid or at least semi-rigid material,  
4 such as plastic or metal.

5 The present invention is further directed to a method for using the device.

6 Thus, the present invention provides for a mechanical system and method for easy  
7 and quick releasable securement of a shoe tongue based on the slide and close device set  
8 forth hereinbelow.

9 Accordingly, one aspect of the present invention is to provide a shoe fastening  
10 device to facilitate movement of the shoe between an open and a closed position  
11 comprising:

12 a base plate including a flat surface, and distal and proximal ends;

13 a pair of substantially parallel spaced apart rod-like members;

14 a sliding tightener device;

15 a central tightening member having two spaced apart arms each having distal and  
16 proximal ends, the distal ends pivotally connected to the base plate at the proximal end of  
17 the base plate;

18 wherein the base plate further includes two spaced apart protruding flange-like  
19 edges with connection points for receiving ends of the pair of substantially parallel  
20 spaced apart rod-like members and permitting the members to rotate or pivot at those  
21 points;

22 wherein the substantially parallel spaced apart rod-like members are pivotally  
23 connected to opposite sides of the sliding tightener device;

1 the device movable between an open position and a closed position, wherein the  
2 sliding tightener device moves toward the proximal ends of each of the arms of the  
3 central tightening member when the device is in a closed position;

4 the device being connectable to the shoe, the shoe having an upper portion with  
5 two sides having spaced apart ends, wherein the base plate is connectable to the inside of  
6 the tongue and the central tightening member arms connectable to the ends of the sides,  
7 such that when the sliding tightener device is moved upward along the central tightening  
8 member arms, the device collapses into a closed position, compressing the arms toward  
9 each other, establishing a predetermined tightness for the closed position.

10 Another aspect of the present invention is to provide a shoe using the device  
11 summarized hereinabove.

12 Still another aspect of the present invention is to provide a method for using the  
13 device to facilitate opening and closing a shoe and providing releasable securement of the  
14 shoe on a user's foot.

15 These and other aspects of the present invention will become apparent to those  
16 skilled in the art after a reading of the following description of the preferred embodiment  
17 when considered with the drawings.

#### 18 Brief Description of the Drawings

19 Figure 1 is a top view of the device according to the present invention.

20 Figure 2 is a side view of the device shown in Fig. 1.

21 Figure 3 is an end view of the device shown in Fig. 1.

22 Figure 4 is a perspective view of components of device in one embodiment according to  
23 the present invention, wherein the device is not affixed to a shoe.

- 1 Figure 5 is an end view of components of the device shown in Figure 4.
- 2 Figure 6 is a top view of components of the device shown in Fig. 4.
- 3 Figure 7 is a side view of components of the device shown in Fig. 4.
- 4 Figure 8 is a bottom view of components of the device shown in Fig. 4.
- 5 Figure 9 is a top view of base plate components of the device.
- 6 Figure 10 is an end view of base plate components of the device.
- 7 Figure 11 is a side view of base plate components of the device.
- 8 Figure 12 is a perspective view of a shoe having a shoe fastening device in an open
- 9 position constructed according to the present invention.
- 10 Figure 13 is a perspective view of a shoe having a shoe fastening device in a closed
- 11 position constructed according to the present invention.
- 12 Figure 14 is another perspective view of a shoe having a shoe fastening device according
- 13 to the present invention.
- 14 Figure 15 is another perspective view of a shoe having a shoe fastening device in an open
- 15 position according to the present invention.
- 16 Figure 16 is another perspective view of a shoe having a shoe fastening device in a
- 17 partially closed position according to the present invention.
- 18 Figure 17 is another perspective view of a shoe having a shoe fastening device moved
- 19 into an open position according to the present invention.
- 20 Figure 18 is another perspective view of a shoe having a shoe fastening device moved
- 21 toward a more closed position (not fully closed) according to the present invention.
- 22 Figure 19 is a top view of a shoe having a shoe fastening device in an open position
- 23 according to the present invention.

1 Detailed Description of the Preferred Embodiments

2 In the following description, like reference characters designate like or  
3 corresponding parts throughout the several views. Also in the following description, it is  
4 to be understood that such terms as "forward," "rearward," "front," "back," "right,"  
5 "left," "upwardly," "downwardly," and the like are words of convenience and are not to  
6 be construed as limiting terms.

7 Referring now to the drawings in general, the illustrations are for the purpose of  
8 describing a preferred embodiment of the invention and are not intended to limit the  
9 invention thereto. As illustrated in the figures, the present invention, generally  
10 referenced 10, as shown in Figures 1-3, provides a shoe fastening device for providing  
11 reliable releasable securement for shoes, particularly for sport or athletic shoes, but also  
12 used for general shoe or boot applications. Figures 12, 13, 14, 15, 16, 17, 18 and 19  
13 show various views of the device attached or affixed to a shoe, generally referenced 40,  
14 with a base plate 12 connectable or connected to an inside of a tongue portion 14 of a  
15 shoe, the base plate having downwardly depending spaced apart members 16 having a  
16 lip, flange, or nodule 18 extending upward on each of the sides of the base plate for  
17 releasably locking the device in a closed or shut position.

18 As shown in Figures 1-10, a device for use with a shoe to facilitate movement of  
19 the shoe between an open and a closed position is shown in various views, the device  
20 including a base plate 12 including a flat surface, and distal 13 and proximal ends 15; a  
21 pair of substantially parallel spaced apart rod-like members 20; a sliding tightener device  
22 22; a central tightening member 24 having two spaced apart arms each having distal and  
23 proximal ends, the distal ends 26 pivotally connected 28 to the base plate at the proximal

1 end of the base plate, preferably the arms of the central tightening member form a  
2 substantially V-shaped member 25, in any case movement of the sliding tightener along  
3 the arms provides for continuous, smooth tightening and release between the open and  
4 closed positions of the device; wherein the base plate further includes two spaced apart  
5 protruding flange-like edges 30 with connection points for receiving ends of the pair of  
6 substantially parallel spaced apart rod-like members and permitting the members to rotate  
7 or pivot at those points; wherein the substantially parallel spaced apart rod-like members  
8 are pivotally connected to opposite sides of the sliding tightener device; the device  
9 movable between an open position and a closed position, wherein the sliding tightener  
10 device moves toward the proximal ends of each of the arms of the central tightening  
11 member when the device is in a closed position; the device being connectable to the shoe,  
12 the shoe having an upper portion with two sides having spaced apart ends, wherein the  
13 base plate is connectable to the inside of the tongue and the central tightening member  
14 arms connectable to the ends of the sides, such that when the sliding tightener device is  
15 moved upward along the central tightening member arms, the device collapses into a  
16 closed position, compressing the arms toward each other, establishing a predetermined  
17 tightness for the closed position.

18 Preferably, the flange-like edges of the base plate further include a lip, flange, or  
19 nodule on each of the edges near a central region of the base plate for releasably locking  
20 the device in the closed position.

21 Also preferably, the sliding tightener device further includes at least one slotted  
22 opening 32 sized, constructed and positioned for receiving the central tightening member  
23 arms to provide for smooth, continuous movement of the sliding tightener device along

1 the arms. In one embodiment of the present invention, the slotted opening is formed by a  
2 single C-shaped slot 34 for receiving both of the arms; this embodiment provides for  
3 increased flexibility and play in the movement of the sliding tightener device as it moves  
4 along the arms between open and closed positions of the device. In an alternative  
5 embodiment of the present invention, the slotted opening is formed by circular cross-  
6 sectional shaped openings at end regions of the sliding tightener device, as shown in  
7 Figures 4-8; this embodiment provides for increased control over the position of the arms  
8 while the sliding tightener device moves along them between open and closed positions.

9 In the preferred embodiment, the shoe fastening device according to the present  
10 invention includes a slide portion formed by a pair of spaced apart parallel rods or rod-  
11 like members having a corresponding ratchet or sliding tightener component or device  
12 that slides along from top to bottom ends of the arms of a substantially V-shaped member  
13 having arms or spaced apart members, such movement or sliding for moving the device  
14 between open and closed positions. The members are connected to the base plate, which  
15 is inserted into a tongue or upper vamp area of a shoe and welded, sewn, or otherwise  
16 secured in place, such as with adhesives, so that movement of the ratchet or sliding  
17 tightener component produces a corresponding movement of the tongue of the shoe for  
18 moving it from open to closed positions and vice versa.

19 The base plate has a distal end affixed to the tongue and a proximal end that is  
20 connected to the V-shaped spaced apart rods by a pivot or rotational member that permits  
21 the shoe tongue to open and close by moving upwardly and downwardly, such that as the  
22 shoe tongue and the base plate attached or affixed thereto move together, the sliding  
23 tightener, which is attached on its outer edges to ends of the substantially parallel spaced



1 apart members, moves along the V-shaped spaced apart members or rods, pulling these  
2 V-shaped spaced apart members closer together, along with the sides of the shoes to  
3 tighten the shoe sides as the tongue closes, wherein the maximum tightness for a given  
4 adjustable setting position of the device is realized when the tongue is completely closed  
5 and the device is in a closed position, with the sliding tightener device at the top of the  
6 tongue near the foot opening hole of the shoe, and the substantially parallel spaced apart  
7 members and the V-shaped spaced apart members are all horizontally aligned, nearly  
8 within a common plane, such that the device appears to be nearly flat.

9 Figure 4-8 of the drawings show the sliding tightener device with related  
10 connected components, and Figures 9-11 show the base plate; none of these drawings  
11 shows the V-shaped or M-shaped rods as in the embodiments of Figures 1 and 14-19;  
12 these drawings 4-11 only show components views, and do not depict the device fully  
13 assembled or connected.

14 Preferably, the device according to the present invention includes V-shaped  
15 spaced apart rods, wherein the branching or spaced-apart distance of the V-shaped  
16 branches close in to closer proximity or decrease the space between them as the slider  
17 moves upward toward the ankle end of the shoe away from the toe end of the shoe;

18 In a preferred embodiment of the present invention, the device is adjustable for  
19 tightness of closure of the shoe to which the device is connected or affixed, by adjusting  
20 the substantially parallel, spaced apart tongue or top rods attached to the base plate,  
21 moving them up or down to the distal or proximal end of the base plate by applying  
22 pressure inward to pull out the ends and inserting the ends or tips into another notch or  
23 hole in the flanged edges of the base plate.

1           The device according to a preferred embodiment of the present invention snaps to  
2 a shut or closed position and held or releasably locked or secured in that position by a lip,  
3 flange, or nodule extending upward on each of the sides of the base plate so that each of  
4 the substantially parallel spaced apart members or rods pass over the corresponding edges  
5 of the lip, flange or nodule and snap or click thereover to be releasably held in the closed  
6 position.

7           The V-shaped members are connected to two opposite sides of an opening in the  
8 shoe top, which are the sides of the area where the laces of a shoe would typically lace up  
9 the shoe in the prior art. This connection of the V-shaped members or rods may be made  
10 via an adhesive, hook-and-loop fasteners, or by inserting an extended portion of each of  
11 the members or rods that bends back downward toward the toe end of the shoe and  
12 extends through a channel, loops or other opening sized and constructed to receive these  
13 members such that they securedly retain each of the V-shaped members to the shoe sides  
14 as the device is manipulated for opening and closing the shoe and releasably locking the  
15 device to hold the tongue of the shoe closed while the shoe is fitted onto a foot.

16           In the latter embodiment, the V-shaped members are actually M-shaped members  
17 having a V-shaped region being formed in the central area or central line of the shoe, the  
18 line running between the toe end to the ankle or heel end of the shoe, splitting the shoe  
19 into inner and outer halves, the inner half corresponding to the inside arch side of the foot  
20 and the outer half corresponding to the outside side of the foot.

21           The present invention features include a continuously increasing tightener that  
22 starts at an open position and closes in a continuous, not step-wise, manner for smooth,  
23 easy tightening and securement, and provides for adjustable final closure level or

1 tightness, wherein the adjustment is set to a predetermined level by the user and secured  
2 to that level after adjustment, which provides a sort of memory of the tightness of the  
3 device and of the shoe when attached thereto, such that a user can set a predetermined  
4 adjustment level of tightness of the device wherein use of the device will always provide  
5 substantially the same level of tightness for each use when in the closed position, unlike  
6 hook-and-loop type fasteners, which provide only for adjustment, without providing any  
7 consistency of tightness or means for ensuring a consistent tightness upon closure of the  
8 fasteners. In a preferred embodiment of the present invention, the device is releasably  
9 secured in a closed position, with the releasable securement being provided by interaction  
10 of the lip, flange, or nodule pairs locking down against the substantially parallel spaced  
11 apart members, which may also be referred to as tongue or top rods, each protruding lip,  
12 flange or nodule pairs locking against the members, respectively, to hold each one in  
13 place in the closed or collapsed position of the device. The tightness is adjusted by  
14 moving the ends of the substantially parallel spaced apart members to different  
15 connecting points along the base plate. In a preferred embodiment of the present  
16 invention, these connecting points are holes in the base plate side flanges, such that the  
17 holes on either side align with each other to provide for even tightness across the width of  
18 the shoe opening, or tongue region if the shoe has a tongue, when the device is in a closed  
19 position.

20       Significantly, the memory for predetermined adjustable tightness is easily  
21 adjustable by moving the ends of the substantially parallel spaced apart members upward  
22 or downward along the base plate, i.e., moving the ends toward the distal end of the base  
23 plate decreases the tightness of the device and toward the proximal end of the base plate

1 increases the tightness of the device in a closed position; once the device is adjusted to  
2 the predetermined tension position corresponding to the end location along the base plate,  
3 the device retains that tension position until the device is readjusted so that each use  
4 provides the same fit or tightness of the shoe on the user's foot.

5 Preferably, the device and its components may be formed of a rigid or at least  
6 semi-rigid material, such as plastic or metal, and combinations thereof, wherein the  
7 plastic material includes but is not limited to nylon, polypropylene, polyethylene, styrene,  
8 polycarbonate, co-blended plastics, composites, and the like, and combinations thereof;  
9 the metal includes but is not limited to titanium, aluminum, magnesium, bronze, copper,  
10 tin, or other lightweight metals, and combinations thereof. The components may be  
11 injection molded, formed, fabricated, machine assembly, or combination thereof,  
12 appropriately, depending upon the material selection, as will be understood by one of  
13 ordinary skill in the art.

14 A metal button 36 may optionally be included on the upper region of the base  
15 plate, and may be used to affix it to the tongue of the shoe, positioned such that, when the  
16 device is in a closed position, the button makes contact with the sliding tightener device  
17 and makes a click or snap sound when the contact is made; this button may further  
18 provide or enhance the device's releasable securement in a closed position when  
19 magnetic properties or a magnet are included in the button with respect to the sliding  
20 tightener device.

21 The present invention also provides a method for using the device including the  
22 steps of: providing the device described in the foregoing, wherein the device is connected  
23 or affixed to a shoe, wherein the a pair of spaced apart parallel rods are connected or

1 affixed to either the tongue or to the sides of the shoe, and the ratchet portion of the  
2 device connected or affixed to the other of either the tongue or the sides of the shoe;

3 sliding the slidable tightener device that connects the V-shaped spaced apart  
4 members or rods and the substantially parallel spaced apart rods or members, wherein the  
5 V-shaped spaced apart members connect to outside ends of the sliding tightener device  
6 and the substantially parallel spaced apart members are held under compression by  
7 running through an opening in the STD, the opening being substantially rectangular or  
8 ovular, with holes facing the toe end and ankle or heel end of the shoe; alternatively, as  
9 shown in the drawings, specifically in Figures 4-11, instead of the sliding tightener  
10 device having a single opening, it may have two spaced apart openings or holes, each of  
11 which is designed, constructed, and configured to receive one of the sides of the V-  
12 shaped spaced apart rods.

13 The present invention is further directed to a method for using the device  
14 including the steps of: providing the device described in the foregoing, wherein the  
15 device is connected or affixed to a shoe, wherein the a pair of spaced apart parallel rods  
16 are connected or affixed to either the tongue or to the sides of the shoe, and the ratchet  
17 portion of the device connected or affixed to the other of either the tongue or the sides of  
18 the shoe; opening the shoe tongue by pulling on it to force the slider or sliding tightener  
19 component by moving it downward with respect to the V-shaped spaced apart rods  
20 toward a proximal end of the base plate; closing the shoe by reversing the direction of the  
21 slider by pushing down on the tongue of the shoe until the locking mechanism clicks into  
22 place; repeating to release and secure the shoe onto a foot; when the device is in an open  
23 position, adjusting the tightness by applying compressive force or pressure to move the

1 substantially parallel spaced apart rods together until their ends withdraw from  
2 corresponding adjustment holes or notches opposite and facing each other on the flange,  
3 moving the rods up or down to adjacent paired holes or notches along the flange to  
4 tighten or loosen the fit of the device when it is in a closed position, and releasing the  
5 pressure on the rods to insert the ends into the new holes or notches, thereby providing  
6 adjustable tightness for the releasably secureable fastening device for shoes according to  
7 a preferred embodiment of the present invention.

8         Certain modifications and improvements will occur to those skilled in the art upon  
9 a reading of the foregoing description. By way of example, the device according to the  
10 present invention may be retrofitted to other shoe models as a closure aid for individuals  
11 with limited dexterity. Also, the device according to the present invention is adaptable  
12 and intended to be provided in a multiplicity of sizes, lengths, and widths for use in  
13 comfort, athletic, street, dress, childrens', and work/industrial shoes and boots, as well as  
14 sandals. Additionally, the device may be adapted for use with skis, skates, and other  
15 athletic implements where a foot, shoe, or boot is insertable and releasably attachable or  
16 secureable thereto. All modifications and improvements have been deleted herein for the  
17 sake of conciseness and readability but are properly within the scope of the following  
18 claims.